

National Aeronautics and Space Administration

FINAL TECHNICAL REPORT FOR NAG 5-3288

Submitted to: Dr. Jean Swank, Code 662
Laboratory for High Energy Astrophysics
NASA/Goddard Space Flight Center
Greenbelt, MD 20771

Submitted by: The Trustees of Columbia University
in the City of New York
351 Eng. Terrace
New York, New York 10027

Prepared by: Columbia Astrophysics Laboratory
Departments of Astronomy and Physics
Columbia University
550 West 120th Street, MC-5247
New York, New York 10027

Principal Investigator: Joseph Patterson

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Final Technical Report for NAG5-3288

Joseph Patterson, Columbia University

Work on NAG5-3288 (“White Dwarf Pulsars”) has been fully integrated with the identically titled project NAG5-4734. The final report below is the same, since the data analysis and interpretative work are integrated, as are the resulting (previous and in-pipeline) publications.

The proposal was designed to study pulse and orbital modulations in candidate DQ Herculis stars. Data on 5 stars were obtained. The best results were obtained on YY Draconis, which exhibited a strongly pulsed hard X-ray flux, and even suggested a transition between one-pole and two-pole emission during the course of the observation. This result is being readied for inclusion in a comprehensive study of YY Draconis. A strong pulsation appeared to be present also in H0857-242, but with a period of ~ 50 minutes, confusion with the first harmonic of the satellite’s orbital frequency is possible. So that result is uncertain and is “on ice”. A negative result was obtained on 4U0608-49 (V347 Pup), suggesting either that the X-ray identification is incorrect, or that the source is very transient.

Finally, data was obtained on V1432 Aql and WZ Sge, respectively the slowest and fastest of these stars. Combined with the ASCA data, the high-energy data demonstrates the latter to contain a white dwarf rotating with $P = 27.87$ s (Patterson et al. 1998, PASP, 110, 403). Optical photometry contemporaneous with the X-ray data was obtained of V1432 Aql, in order to study the variations in the eclipse waveform. As anticipated, the width and centroid of the eclipse appeared to vary with the 50-day “supercycle”. A paper reporting this study is now in preparation.